$$w_1(r_d)_S = 2r_d e^{-r_d^2-r_{oa}^2} I_o(2r_{oa}r_d), \quad (r_d, r_{oa} \geq 0), \tag{3.4a}$$

or

$$w_1(\lambda)_S = \frac{2c_o^2}{\hat{r}_o^2} \lambda e^{-\lambda^2(c_o/\hat{r}_o)^2-r_{oa}^2} I_o(2r_{oa}c_o\lambda/\hat{r}_o), \quad (r_{oa}, \lambda > 0). \tag{3.4b}$$

When the source is not moving, but its location is unknown to the receiver, the pdf of its location can be usefully expressed alternatively by the density function [9],

$$\left.\begin{aligned} w_1(\lambda)_S = B_\mu \lambda^{1-\mu} d\lambda w_1(\phi) d\phi \quad ; \quad B_\mu = \frac{2-\mu}{\lambda_1^{2-\mu}-\lambda_o^{2-\mu}} \; ; \; (0<)\lambda_o \leq \lambda_1(<\infty) \\ 0 \leq \phi \leq 2\pi \end{aligned}\right\} , \; \mu \geq 0. \tag{3.5}$$

for the simple geometry of Figure 3.1, where the possible location of the source is in the region Λ_S. Other, more complex geometries may be handled in the same fashion, but this rather simple model often gives reasonable and representative results.

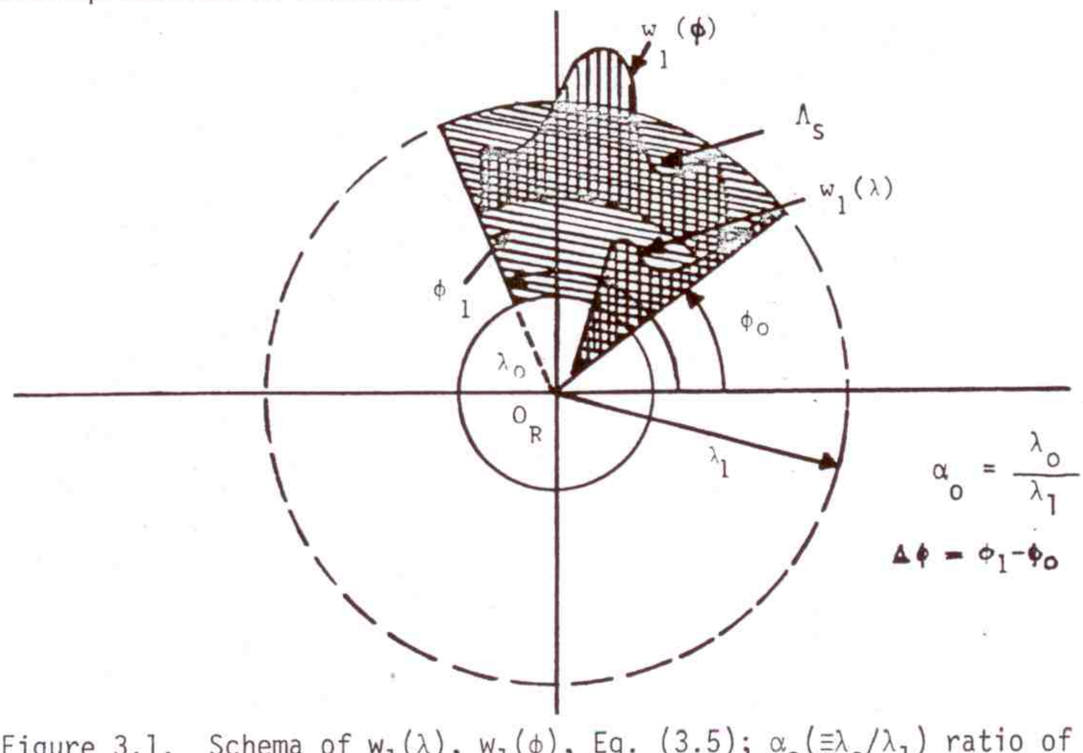

Figure 3.1. Schema of $w_1(\lambda)$, $w_1(\phi)$, Eq. (3.5); $\alpha_o(\equiv\lambda_o/\lambda_1)$ ratio of inner to outer radii.